CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company

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Date : 20.06.2022

Job No.: CACE/BBMP/KTR/W.No.14 /2021-22

Aggregate Gradation Test

IS : 2386 Part I

Client	: Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.
Agency	: M/s K T R Constructions(Prop.K.T.Ravi), Contractor, Mysore.
Name of the Work	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	20.06.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	451	9.02	9.02	90.98	90 - 100	
9.5	488	9.76	18.78	81.22	70 - 88	
4.75	652	13.04	31.82	68.18	53 - 71	
2.36	687	13.74	45.56	54.44	42 - 58	
1.18	549	10.98	56.54	43.46	34 - 48	
0.600	552	11.04	67.58	32.42	26 - 38	
0.300	499	9.98	77.56	22.44	18 - 28	
0.150	378	7.56	85.12	14.88	12 - 20	
0.075	501	10.02	95.14	4.86	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	473	9.46	9.46	90.54	90 - 100	
9.5	581	11.62	21.08	78.92	70 - 88	
4.75	692	13.84	34.92	65.08	53 - 71	
2.36	581	11.62	46.54	53.46	42 - 58	
1.18	575	11.50	58.04	41.96	34 - 48	
0.600	552	11.04	69.08	30.92	26 - 38	
0.300	559	11.18	80.26	19.74	18 - 28	
0.150	243	4.86	85.12	14.88	12 - 20	
0.075	395	7.90	93.02	6.98	4 - 10	

Note:

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

FOR CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
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Job No.: CACE/BBMP/KTR/W.No.14 /2021-22 Date: 20.06.2022

TEST REPORT

Client	:	**Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.**
Agency	:	**M/s K T R Constructions(Prop.K.T.Ravi),** *Contractor, Mysore.*
Name of the work	:	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	20.06.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	57	Min 45
2	Softening point, ^{0}C	52	Min. 47
3	Ductility at 27^{0}C, cm	> 110	Min. 40
4	Flash Point, ^{0}C	278	Min. 220

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Job No: CACR/BBMP/KTR/W.No.14 /2021-22 Date : 20.06.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.
Agency	: M/s K T R Constructions(Prop.K.T.Ravi), Contractor, Mysore.
Name of Work	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	20.06.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	12.5	12.8	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	12.9	13.1	
	Combined Flakiness & Elongation index	25.40	25.90	

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Job No.: CACE/BBMP/KTR/W.No.14 /2021-22

Date : 22.06.2022

Specific Gravity And Water Absorption Test

Client	: Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.
Agency	: M/s K T R Constructions(Prop.K.T.Ravi), Contractor, Mysore.
Name of the Work	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	20.06.2022 to 22.06.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2025	2027	2029	
2	Weight of basket suspended in water	W_2 g	754	756	757	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1271	1271	1272	
4	Weight of saturated surface dry aggregate in air	W_3 g	2021	2020	2022	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	750	749	750	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.680	2.685	2.683	2.683
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.720	2.718	2.719	2.719
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.55%	0.45%	0.50%	0.50%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Job No.: CACE/BBMP/KTR/W.No.14 /2021-22 Date: 27.06.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.**
Agency	:	**M/s K T R Constructions(Prop.K.T.Ravi),** Contractor, Mysore.
Name of the Work	:	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	27.06.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.33	10.62	9 Kn (min)
2	Marshal flow, mm	3.59	3.81	2 – 4
3	Percent air voids in Mineral Aggregate	14.23	14.43	13 – 15
4	Voids in Compacted Mix	4.19	5.44	3 – 6
5	Percent Voids filled with Bitumen	71.10	71.84	65 - 75
6	Density, g/cc	2.21	2.23	--

Note:

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Job No.: CACE/BBMP/KTR/W.No.14 /2021-22

Date: 29.06.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.**
Agency	:	**M/s K T R Constructions(Prop.K.T.Ravi),** Contractor, Mysore.
Name of the Work	:	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	29.06.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.52	10.11	9 Kn (min)
2	Marshal flow, mm	2.49	3.21	2 – 4
3	Percent air voids in Mineral Aggregate	13.32	14.39	13 – 15
4	Voids in Compacted Mix	3.81	4.97	3 – 6
5	Percent Voids filled with Bitumen	68.32	70.11	65 - 75
6	Density, g/cc	2.22	2.24	--

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Lab No. CACE/BRNH KTR/ B No.04 /2023-24 Date: 07.06.2023

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

As per MORTH 5th Revision

CLIENT	: Assistant Executive Engineer, Dasanahalli Sub division, BBMP, Bangalore.
AGENCY	: M/s K.T.S Constructions (Prop.K.T.Ravi), Channapatna, Mysuru.
NAME OF THE WORK	Improvement to roads and drains near Mysuru Road Junction and Other area in Rajajinagar ward no.14, BBMP, Bangalore
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	07.06.2023

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474.5	472.5
3. Weight of Asphalt and Mineral matter Extracted, g	25.5	27.5
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g (corrected)	25.5	27.5
7. Bitumen content in %	5.10	5.50
8. Average	5.30	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.5	14.5	3.2	96.8	90 - 100
9.5	68.3	82.8	17.1	82.9	70 - 88
4.75	90.8	173.6	38.8	61.2	53 - 71
2.36	44.3	218.0	48.3	51.7	42 - 58
1.18	39.2	257.7	54.7	45.3	34 - 48
0.600	52.1	309.8	65.7	34.3	26 - 38
0.300	46.2	356	76.5	24.5	18 - 28
0.150	34.5	390.5	82.9	17.1	12 - 20
0.075	46.5	437.4	92.8	7.2	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	16.7	16.7	3.5	96.5	90 - 100
9.5	65.2	81.9	17.3	82.7	70 - 88
4.75	92.1	145	30.7	69.3	53 - 71
2.36	45.3	190.3	40.4	59.6	42 - 58
1.18	46.2	237.1	50.2	49.8	34 - 48
0.600	54.8	291.9	61.8	38.2	26 - 38
0.300	50.2	342.1	72.4	27.6	18 - 28
0.150	45.8	387.9	82.1	17.9	12 - 20
0.075	49.1	437	92.5	7.5	4 - 10

Note:

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2. The results relate only to the samples collected at the site.
3. Sample will be disposed off from the date of testing.

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Job No.: CACE/BBMP/KTR/W.No.14 /2021-22 Date : 29.06.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Assistant Executive Engineer ,Dasarahalli Sub division, BBMP, Bangalore.
AGENCY	: M/s K T R Constructions(Prop.K.T.Ravi), Contractor, Mysore.
NAME OF THE WORK	Improvements to roads and drains near Magnum School Surrounding and Other area in Bagalagunte ward no.14, BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	29.06.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	471.5	472.5
3. Weight of Asphalt and Mineral matter Extracted, g	28.5	27.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28.5	27.5
7. Bitumen content in %	5.70	5.50
8. Average	5.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.9	14.9	3.2	96.8	90 - 100
9.5	65.9	80.8	17.1	82.9	70 - 88
4.75	92.8	173.6	36.8	63.2	53 - 71
2.36	44.9	218.5	46.3	53.7	42 - 58
1.18	39.2	257.7	54.7	45.3	34 - 48
0.600	52.1	309.8	65.7	34.3	26 - 38
0.300	46.2	356	75.5	24.5	18 - 28
0.150	34.9	390.9	82.9	17.1	12 - 20
0.075	46.5	437.4	92.8	7.2	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	16.7	16.7	3.5	96.5	90 - 100
9.5	65.2	81.9	17.3	82.7	70 - 88
4.75	63.1	145	30.7	69.3	53 - 71
2.36	45.9	190.9	40.4	59.6	42 - 58
1.18	46.2	237.1	50.2	49.8	34 - 48
0.600	54.8	291.9	61.8	38.2	26 - 38
0.300	50.2	342.1	72.4	27.6	18 - 28
0.150	45.8	387.9	82.1	17.9	12 - 20
0.075	49.1	437	92.5	7.5	4 - 10

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